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EXAMINER	
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ART UNIT	**PAPER NUMBER**
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Please find below and/or attached an Office communication concerning this application or proceeding.

PTO-90C (Rev. 07-01)

Office Action Summary	Application No.	Applicant(s)
	09/750,311	ARECCO ET AL.
	Examiner	**Art Unit**
	David S. Kim	2633

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on 29 December 2000.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) 1-35 is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) 1-35 is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on 16 April 2001 is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☒ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____.
4) ☐ Interview Summary (PTO-413) Paper No(s). _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other:

DETAILED ACTION

Priority

1. Acknowledgment is made of applicant's claim for foreign priority based on an application filed in Europe on 31 May 2000. It is noted, however, that applicant has not filed a certified copy of the 01-11594.8 application as required by 35 U.S.C. 119(b).

Specification

2. The abstract of the disclosure is objected to because of undue length. Correction is required. See MPEP § 608.01(b).

Applicant is reminded of the proper language and format for an abstract of the disclosure.

The abstract should be in narrative form and generally limited to a single paragraph on a separate sheet within the range of 50 to 150 words. It is important that the abstract not exceed 150 words in length since the space provided for the abstract on the computer tape used by the printer is limited. The form and legal phraseology often used in patent claims, such as "means" and "said," should be avoided. The abstract should describe the disclosure sufficiently to assist readers in deciding whether there is a need for consulting the full patent text for details.

The language should be clear and concise and should not repeat information given in the title. It should avoid using phrases which can be implied, such as, "The disclosure concerns," "The disclosure defined by this invention," "The disclosure describes," etc.

3. The disclosure is objected to because of the following informalities:

The pages are not numbered.

Throughout the specification, there appears to be minor typographical errors such as "chilometers" instead of "kilometers" on page 4, line 20; "failured" instead of "failed" in multiple locations; and "in a" instead of "into an" on page 11, lines 12, 14, 22, and 25. This is not an exhaustive list but is mentioned to expedite a compact examination process.

The specification lacks headings for each section.

Throughout the specification, there appears to be discrepancies with the drawings, such as the usage of "first" instead of "second" on page 12, line 9; "second" instead of "first" on page 12, line 11; an inaccurate table on page 22; 15' instead of 15" on page 25, line 2; "receiving"

instead of "transmitting" on page 37, line 26; and "first" instead of "fourth" on page 41, line 25. This is not an exhaustive list but is mentioned to expedite a compact examination process.

An entire section describing "Node D" on page 39 is missing.

Appropriate correction is required.

Claim Objections

4. **Claims 1, 6-9, 14, and 24** are objected to because of the following informalities:

In claims 1 and 14, it seems that "failured" is used where "failed" may be intended.

In claim 6, line 4, it seems that " signals " is used where " signals' " may be intended.

In claim 7, line 2, it seems that "spitter" is used where "splitter" may be intended.

In claim 8, lines 2-3, it seems that "spitter" and "spit" are used where "splitter" and "split" may be intended, respectively.

In claim 9, lines 1 and 4, it seems that "claims" and "coupled the" are used where "claim" and "coupled to the" may be intended, respectively.

In claim 24, line 3, it seems that "carrying an information" is used where "carrying information" may be intended.

Appropriate correction is required.

Claim Rejections - 35 USC § 112

5. The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

6. **Claims 24** is rejected under 35 U.S.C. 112, first paragraph, because the specification, while being enabling for converting an optical signal into an electrical signal and vice versa, does not reasonably provide enablement for converting an optical signal in an electrical signal or an electrical signal in an optical signal. The specification does not enable any person skilled in the

art to which it pertains, or with which it is most nearly connected, to use the invention commensurate in scope with these claims.

It is generally known in the art that optical signals are not in electrical signals and that electrical signals are not in optical signals. Accordingly, the meaning of "converting" or "reconverting" such signals is indefinite. In lines 4, 6, 14, and 17, it seems that "in a" and "in an" are used where "into an" may be intended.

7. **Claim 25** is rejected under 35 U.S.C. 112, first paragraph, because the specification, while being enabling for "a second receiving transponder ($RxT_2(\lambda_y)$) for optically coupling to the *second* carrier (*3*)," does not reasonably provide enablement for "a second receiving transponder ($RxT_2(\lambda_y)$) for optically coupling to the *first* carrier (*2*)" (lines 17-18). Also, while being enabling for "a third receiving transponder ($RxT_1(\lambda_y)$) for optically coupling to the *first* carrier (*2*)," the specification does not reasonably provide enablement for "a third receiving transponder ($RxT_1(\lambda_y)$) for optically coupling to the *second* carrier (*3*)" (lines 20-21). The specification does not enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to use the invention commensurate in scope with these claims.

The drawings display a second receiving transponder ($RxT_2(\lambda_y)$) for optically coupling to the *second* carrier (*3*). Accordingly, it is indefinite why one would couple the second receiving transponder ($RxT_2(\lambda_y)$) to the *first* carrier (*2*). In lines 17-18, it seems that "first" and "2" are used where "second" and "3" may be intended, respectively.

The drawings also display a third receiving transponder ($RxT_1(\lambda_y)$) for optically coupling to the *first* carrier (*2*). Accordingly, it is indefinite why one would couple the third receiving transponder ($RxT_1(\lambda_y)$) to the *second* carrier (*3*). In lines 20-21, it seems that "second" and "3" are used where "first" and "2" may be intended, respectively.

Claim Rejections - 35 USC § 102

8. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

9. **Claims 1, 3-4, 9, 14-15, and 22-23** are rejected under 35 U.S.C. 102(b) as being anticipated by Cadeddu et al. (U.S. Patent No. 5,647,035).

Regarding claim 1, Cadeddu et al. discloses:

Autoprotected optical communication ring network (Figs. 1-2), including a first (optical fiber 3A in Figs. 1-2) and a second optical carrier (optical fiber 3B in Figs. 1-2) having opposite transmission directions (clockwise in fiber 3A and counterclockwise in fiber 3B in Figs. 1-2) and a plurality of optically reconfigurable nodes (nodes 2A-2F in Figs. 1-2) optically connected along the first and the second optical carrier and adapted to communicate in pairs (pairs of nodes in Figs. 1-2) by means of respective links susceptible of failure (col. 5, lines 58-60), the ring network having a normal operative condition in which the nodes of each pair are optically configured so as to exchange optical signals on a respective working arc path (working paths shown in Fig. 1) at a respective first wavelength (λ_1 in Fig. 1) on the first carrier (fiber 3A in Fig. 1) and at a respective second wavelength (λ_2 in Fig. 1) different from said first wavelength (λ_1 in Fig. 1) on the second carrier (fiber 3B in Fig. 1), said respective working path having a complementary arc path defining a respective protection arc path (protection path from node 2B to node 2C by way of nodes 2A, 2F, 2E, and 2D in Fig. 2) in which the first wavelength (λ_1 in Fig.

2) on the first carrier (fiber 3A in Fig. 2) and the second wavelength (λ2 in Fig. 2) on the second carrier (fiber 3B in Fig. 2) can be used for further links (link pairs of nodes 2A-2B, 2A-2F, 2F-2E, 2E-2D, and 2D-2C in Fig. 2) and the first wavelength (λ1 in Fig. 2) on the second carrier (fiber 3B in Fig. 2) and the second wavelength (λ2 in Fig. 2) on the first carrier (fiber 3A in Fig. 2) are reserved for protection (col. 2, lines 42-47), characterized in that the ring network has a failure operative condition in which the nodes terminating a failed link (nodes 2B and 2C in Fig. 2) are optically reconfigured (Fig. 2) so as to exchange optical signals on the respective protection arc path at the respective second wavelength (λ2 in Fig. 2) on the first carrier (fiber 3A in Fig. 2) and at the respective first wavelength (λ1 in Fig. 2) on the second carrier (fiber 3B in Fig. 2).

Regarding claim 3, Cadeddu et al. discloses:

Ring network according to claim 1 or 2, wherein said plurality of reconfigurable nodes (nodes 2A-2F in Figs. 1-2) includes at least a signal input (inputs to switches 12A-12B in Figs. 3-6) at least a signal output (outputs from switches 11A-11B in Figs. 3-6) and a reconfigurable optical switch unit (switches 11A-11B and 12A-12B in Figs. 3-6) selectively coupling said at least an signal input and said at least a signal output to said first and second carriers.

Regarding claim 4, Cadeddu et al. discloses:

Ring network according to claim 3, wherein said at least a signal input is optically coupled to a respective optical transmitter (transmitters 14B and 15A in Figs. 3-6) and said at least a signal output is optically coupled to a respective optical receiver (receivers 14A and 15B in Figs. 3-6).

Regarding claim 9, Cadeddu et al. discloses:

Ring network according to claim 3, wherein said optical switch unit (switches 11A-11B and 12A-12B in Figs. 3-6) includes at least a first switch (switches 12A-12B in Fig. 3) having a first input (inputs to switches 12A-12B from transmitters 14B and 15A in Fig. 3) optically

coupled to a respective signal input (transmitters 14B and 15A in Fig. 3), a second input (inputs to switches 12A-12B from switches 11A-11B in Fig. 3) coupled to either the first or the second carrier (fibers 3A-3B in Fig. 3) and an output (outputs from switches 12A-12B in Fig. 3) coupled to the same carrier.

Regarding claim 14, claim 14 is a method claim that corresponds largely to the system claim 1. Therefore, the recited means in system claim 1 read on the corresponding steps in method claim 14. Claim 14 also includes limitations absent from claim 1. These limitations are:

each pair of communicating nodes including a first and a second link termination node adapted to mutually communicate at respective first and second wavelengths; and

checking if a failure is present in the ring network producing at least a failed link.

Cadeddu et al. also discloses such termination nodes (nodes 2B and 2C in Fig. 2) and such checking (col. 7, lines 63-64).

Regarding claim 15, Cadeddu et al. discloses:

Method according to claim 14, wherein each node of said plurality of nodes is adapted to manage a predetermined subset of wavelengths (λ1-λ2 in Figures) within a set of transmission wavelengths (λ1-λ2 in Figures) carried by the first and the second carrier, said step of exchanging including optically separating (demultiplexers 10A-10B in Figs. 3-6), at each node of said plurality of nodes, each wavelength of the respective subset of wavelengths from the set of transmission wavelengths.

Regarding claim 22, claim 22 is a method claim that corresponds to system claim 4. Therefore, the recited means in system claim 4 read on the corresponding steps in method claim 22.

Regarding claim 23, Cadeddu et al. discloses:

Method according to claim 15, wherein the step of exchanging includes feeding (ADMs 13 in Figs. 3-6) at each of said plurality of nodes the corresponding subset of wavelengths to said first and, respectively, second carrier.

10. **Claims 1-6, 14-15, 18-23, 25-27, and 29-33** are provisionally rejected under 35 U.S.C. 102(e) as being anticipated by copending Application No. 09/608,657 which has a common inventor and a common assignee with the instant application. Based upon the earlier effective U.S. filing date of the copending application, it would constitute prior art under 35 U.S.C. 102(e), if published under 35 U.S.C. 122(b) or patented. This provisional rejection under 35 U.S.C. 102(e) is based upon a presumption of future publication or patenting of the copending application.

Regarding claim 1 of the instant application, consider claim 1 of the copending application. The "ring network" in claim 1 of the instant application corresponds to the "system" in claim 1 of the copending application. The notable difference between the conflicting claims is the presence of the following limitations in claim 1 of the instant application; that is, the following limitations are absent from claim 1 of the copending application:

a ring network; and

said respective working path having a complementary arc path defining a respective protection arc path in which the first wavelength on the first carrier and the second wavelength on the second carrier can be used for further links.

However, the copending application also discloses such a ring network (copending application, Fig. 2) and such a complementary arc path (copending application, Fig. 9).

Regarding claims 2-6, claims 2, 3, 4, 5, and 6 of the instant application are network claims that correspond closely to system claims 2, 3, 3, 4, and 5 of the copending application, respectively. The notable difference between claims 2-6 of the instant application and claims 2-5 of the copending application is the express disclosure of a signal input and a signal output

(instant application, claim 3). However, the copending application discloses a switch unit coupled to an optical transmitter and to an optical receiver (copending application, claim 3); these couplings inherently comprise the signal input and signal output of the instant application.

Regarding claim 14 of the instant application, consider claim 6 of the copending application. The notable difference between the conflicting claims is the presence of the following limitations in the instant application; that is, the following limitations are absent from the copending application:

each pair including a first and a second link termination node adapted to mutually communicate at respective first and second wavelengths; and

said respective working path having a complementary arc path defining a respective protection arc path in which the first wavelength on the first carrier and the second wavelength on the second carrier can be used for further links.

However, the copending application also discloses such a pair of termination nodes (copending application, nodes 20c and 20f in Fig. 2) and such a complementary arc path (copending application, Fig. 9).

Regarding claims 15 and 18-22, claims 15, 18, 19, 20, 21, and 22 of the instant application are network claims that correspond closely to system claims 7, 8, 9, 10, 11, and 12 of the copending application, respectively. The differences between claims 15 and 18-22 of the instant application and claims 7-12 of the copending application are minor variations in the claim language; the main limitations are the same.

Regarding claim 23, claim 23 is a method claim that corresponds to system claim 2. Therefore, the recited means in system 2 read on the corresponding steps in method claim 23.

Regarding claims 25-27 and 29-33, claims 25, 26, 27, 29, 30, 31, 32, and 33 of the instant application are node claims that correspond closely to node claims 14, 15, 16, 17, 18, 19,

20, and 21 of the copending application, respectively. The notable difference between claims 25-27 and 29-33 of the instant application and claims 14-21 of the copending application is the presence of extra limitations (copending application, claim 13) in the copending application; that is, these extra limitations are absent from the instant application. Thus, claims 25-27 and 29-33 of the instant application define a broader version of the invention defined in claims 14-21 of the copending application.

This provisional rejection under 35 U.S.C. 102(e) might be overcome either by a showing under 37 CFR 1.132 that any invention disclosed but not claimed in the copending application was derived from the inventor of this application and is thus not the invention "by another," or by an appropriate showing under 37 CFR 1.131. This rejection may not be overcome by the filing of a terminal disclaimer. See *In re Bartfeld*, 925 F.2d 1450, 17 USPQ2d 1885 (Fed. Cir. 1991).

Claim Rejections - 35 USC § 103

11. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

12. **Claims 1-5, 7-10, and 14-23** are rejected under 35 U.S.C. 103(a) as being unpatentable over Shiragaki et al. (European Patent Application EP 920153 A2) in view of Cadeddu et al.

Regarding claim 1, Shiragaki et al. discloses:

Autoprotected optical communication ring network (Figures), including a first (ring 101 in Fig. 8) and a second optical carrier (ring 102 in Fig. 8) having opposite transmission directions (clockwise in ring 101 and counterclockwise in ring 102 in Fig. 8) and a plurality of optically reconfigurable nodes (nodes A and B in Fig. 8) optically connected along the first and the second optical carrier and adapted to communicate in pairs (pairs of nodes in Figures) by

means of respective links susceptible of failure (col. 13, line 48), the ring network having a normal operative condition in which the nodes of each pair are optically configured so as to exchange optical signals on a respective working arc path (working path in Fig. 11A) at a respective first wavelength (λ1 in Fig. 8) on the first carrier (ring 101 in Fig. 8) and at a respective second wavelength (λ3 in Fig. 8) different from said first wavelength (λ1 in Fig. 8) on the second carrier (ring 102 in Fig. 8), said respective working path having a complementary arc path defining a respective protection arc path (protection path through nodes 105 and 108 in Fig. 11A) in which the first wavelength (λ1 in Fig. 8) on the second carrier (ring 102 in Fig. 8) and the second wavelength (λ3 in Fig. 8) on the first carrier (ring 101 in Fig. 8) are reserved for protection (col. 13, lines 30-35), characterized in that the ring network has a failure operative condition in which the nodes terminating a failed link (nodes A and B in Fig. 8) are optically reconfigured (Fig. 10) so as to exchange optical signals on the respective protection arc path at the respective second wavelength (λ3 in Fig. 10) on the first carrier (ring 101 in Fig. 10) and at the respective first wavelength (λ1 in Fig. 10) on the second carrier (ring 102 in Fig. 10).

Shiragaki et al. does not expressly disclose:

said respective protection arc path (protection path through nodes 105 and 108 in Fig. 11A) wherein the first wavelength (λ1 in Fig. 8) on the first carrier (ring 101 in Fig. 8) and the second wavelength (λ3 in Fig. 8) on the second carrier (ring 102 in Fig. 8) can be used for further links.

Cadeddu et al. teaches such a respective protection arc path (Cadeddu et al., protection path from node 2B to node 2C by way of nodes 2A, 2F, 2E, and 2D in Fig. 2) with such further links (Cadeddu et al., link pairs of nodes 2A-2B, 2A-2F, 2F-2E, 2E-2D, and 2D-2C in Fig. 2). At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to use the respective protection arc path of Shiragaki et al. to carry further links, as taught in Cadeddu et al. One of ordinary skill in the art would have been motivated to do this "to allow

full exploitation of the transmission capacity" (Cadeddu et al., col. 2, lines 25-26) and to enable communication to continue "on the other carriers included in the same connection" (Cadeddu et al., col. 8, lines 18-24).

Regarding claim 2, Shiragaki et al. in view of Cadeddu et al. discloses:

Ring network according to claim 1, wherein each of said plurality of reconfigurable nodes (nodes A and B in Fig. 8) is adapted to manage a predetermined subset of wavelengths ($\lambda 1$ and $\lambda 3$ in Fig. 10) within a set of transmission wavelengths ($\lambda 1$-$\lambda 4$ in Fig. 10) and includes a first and a second optical add/drop multiplexer (Fig. 10) serially connected to said first (ring 101 in Fig. 10) and, respectively, second carrier (ring 102 in Fig. 10) to feed/extract said subset of wavelengths to/from said first and, respectively, second carrier, and to pass-through the remaining wavelengths ($\lambda 2$ and $\lambda 4$ in Fig. 10) of the set of transmission wavelengths.

Regarding claim 3, Shiragaki et al. in view of Cadeddu et al. discloses:

Ring network according to claim 1 or 2, wherein said plurality of reconfigurable nodes (nodes A and B in Fig. 8) includes at least a signal input (inputs to protection switches for transmitting in Figures) at least a signal output (outputs from protection switches for receiving in Figures) and a reconfigurable optical switch unit (protection switches and path switches in Figures) selectively coupling said at least an signal input and said at least a signal output to said first and second carriers.

Regarding claim 4, Shiragaki et al. in view of Cadeddu et al. does not expressly disclose:

Ring network according to claim 3, wherein said at least a signal input is optically coupled to a respective optical transmitter and said at least a signal output is optically coupled to a respective optical receiver.

However, Cadeddu et al. also teaches such inputs optically coupled to respective optical transmitters (Cadeddu et al., transmitters 14B and 15A in Figs. 3-6) and such outputs optically

coupled to respective optical receivers (Cadeddu et al., receivers 14A and 15B in Figs. 3-6). At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to couple the inputs of Shiragaki et al. to transmitters and the outputs of Shiragaki et al. to receivers, as taught in Cadeddu et al. One of ordinary skill in the art would have been motivated to do this since transmitters and receivers are inherently necessary to generate and process optical signals in the nodes of Shiragaki et al. in view of Cadeddu et al.

Regarding claim 5, Shiragaki et al. in view of Cadeddu et al. discloses:

Ring network according to claim 3 or 4, wherein each of said plurality of reconfigurable nodes includes information insertion devices (monitor circuits and protection switches in Figures) selectively optically connectable to said at least a signal input and adapted to insert signalling information (col. 6, lines 1-4) into the optical signals and information extraction devices (monitor circuits and protection switches in Figures) selectively optically connectable to said at least a signal output and adapted to extract signalling information from the optical signals (col. 6, lines 41-53).

Regarding claim 7, Shiragaki et al. in view of Cadeddu et al. discloses:

Ring network according to claim 3, wherein at least one of said reconfigurable nodes includes at least a first signal splitter (splitters in ADMs/path switches in Figures) adapted to receive a signal from either the first or the second carrier and to split said signal into a first and a second fraction which are sent towards a respective signal output and towards the same carrier, respectively.

Regarding claim 8, Shiragaki et al. in view of Cadeddu et al. discloses:

Ring network according to claim 3, wherein at least one of said reconfigurable nodes (node A in Fig. 15A-C) includes at least a second signal splitter (optical splitters 1501-1502 in Figs. 15A-C) optically coupled to a respective signal input (input to protection switches in Figs. 15A-C) and adapted to split a signal coming from the respective signal input into a first and a

second fraction which are sent towards the first carrier (rings 101 and 103 in Figs. 11A-15C) and the second carrier (rings 102 and 104 in Figs. 11A-15C), respectively.

Regarding claim 9, Shiragaki et al. in view of Cadeddu et al. discloses:

Ring network according to claim 3, wherein said optical switch unit (protection switches and path switches in Figures) includes at least a first switch (path switches in Figures) having a first input optically coupled to a respective signal input (inputs to path switches from protection switches in Figures), a second input (inputs to path switches from demultiplexers in Figures) coupled to either the first or the second carrier (rings in Figures) and an output (output from path switches) coupled to the same carrier.

Regarding claim 10, Shiragaki et al. in view of Cadeddu et al. discloses:

Ring network according to claim 8, wherein said optical switch unit (protection switches and path switches in Figures) includes at least a second switch (protection switches TO NETWORK ELEMENT in Figures) having a first input coupled (via splitters) to the first carrier (rings 101 and 103 in Figs. 11A-15C), a second input coupled (via splitters) to the second carrier (rings 102 and 104 in Figs. 11A-15C), and an output optically coupled to a respective signal output (output TO NETWORK ELEMENT from protection switches).

Regarding claim 14, claim 14 is a method claim that corresponds largely to the system claim 1. Therefore, the recited means in system claim 1 read on the corresponding steps in method claim 14. Claim 14 also includes limitations absent from claim 1. These limitations are:

each pair of communicating nodes including a first and a second link termination node adapted to mutually communicate at respective first and second wavelengths; and

checking if a failure is present in the ring network producing at least a failed link.

Shiragaki et al. in view of Cadeddu et al. also discloses such termination nodes (nodes A and B in Fig. 8) and such checking (col. 13, line 48 and col. 14, line 4).

Regarding claim 15, claim 15 is a method claim that corresponds largely to the system claim 2. Therefore, the recited means in system claim 2 read on the corresponding steps in method claim 15. Claim 15 also includes a limitation absent from claim 2. This limitation is:

optically separating *each* wavelength of the respective subset of wavelengths from the set of transmission wavelengths.

Shiragaki et al. in view of Cadeddu et al. also discloses such separating (demultiplexers in Figures).

Regarding claim 16, Shiragaki et al. in view of Cadeddu et al. discloses:

Method according to claim 14, including the steps of inserting a signal into one of said nodes (node A in Fig. 15A-C), splitting (optical splitters 1501-1502 in Figs. 15A-C) said signal into a first and a second fraction and sending said first fraction towards the first carrier (rings 101 and 103 in Figs. 11A-15C) and the second power fraction towards the second carrier (rings 102 and 104 in Figs. 11A-15C).

Regarding claim 17, claim 17 is a method claim that corresponds to system claim 7. Therefore, the recited means in system claim 7 read on the corresponding steps in method claim 17.

Regarding claim 18, Shiragaki et al. in view of Cadeddu et al. discloses:

Method according to claim 14, wherein the step of checking includes verifying, in each node of said plurality of nodes and for each wavelength of the respective set of wavelengths, if signals are received (col. 7, lines 15-19, verification of signal reception is inherently part of monitoring the BER).

Regarding claim 19, Shiragaki et al. in view of Cadeddu et al. discloses:

Method according to claim 14, wherein said step of checking includes verifying, in each node of said plurality of nodes and for each wavelength of the respective set of wavelengths, if signals are received degraded (col. 7, lines 15-19).

Regarding claim 20, Shiragaki et al. in view of Cadeddu et al. discloses:

Method according to claim 14, wherein said step of checking includes verifying, in each node of said plurality of nodes and for each wavelength of the respective set of wavelengths, if signals include a failure message (col. 7, lines 41-51).

Regarding claim 21, Shiragaki et al. in view of Cadeddu et al. discloses:

Method according to claim 14, further including transmitting a failure message (col. 7, lines 15-51, OAM frame) from a first link termination node (col. 7, lines 15-51, destination node) of a pair to a second link termination node (col. 7, lines 15-51, source node) of the same pair if a signal transmitted from the second link termination node to the first link termination node is not received, or is received degraded, by the first link termination node.

Regarding claims 22-23, claims 22-23 are method claims that correspond to system claims 4 and 2, respectively. Therefore, the recited means in system claims 4 and 2 read on the corresponding steps in method claim 22-23.

13. **Claims 6 and 24** are rejected under 35 U.S.C. 103(a) as being unpatentable over Shiragaki et al. in view of Cadeddu et al. as applied to claims 5 and 14 above, and further in view of Karasan et al. ("Optical restoration at the wavelength-multiplex-section level in WDM mesh networks").

Regarding claim 6, Shiragaki et al. in view of Cadeddu et al. discloses:

Ring network according to claim 5, wherein said information insertion devices (monitor circuits and protection switches in Figures) and said information extraction devices (monitor circuits and protection switches in Figures) optically couple said optical switch unit (switches in Figures) to said first and second carrier.

Shiragaki et al. in view of Cadeddu et al. does not expressly disclose:

said information insertion and extraction devices including optical transponders adapted to change the signals' wavelengths.

However, Karasan et al. teaches such transponders (Karasan et al., page 1343, col. 2, last paragraph). At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to include the transponders of Karasan et al. in the information insertion and extraction devices of Shiragaki et al. in view of Cadeddu et al. One of ordinary skill in the art would have been motivated to do this "to arrest accumulating performance-degradations; provide the open, nonproprietary interfaces that permit multivendor interworking; and offer a means of carrying out the performance-monitoring and fault-localization that are essential in deployed networks" (Karasan et al., page 1343, col. 2, last paragraph – page 1344, col. 1, 1st paragraph).

Regarding claim 24, Shiragaki et al. in view of Cadeddu et al. discloses:

Method according to claim 14, wherein the step of exchanging signals includes the following steps executed in the first link termination node of a pair:

- generating an optical signal carrying information (signals generated from network elements and input into protection switches in Figures) ; and

- feeding the optical signal at the predetermined wavelength to either the first or the second carrier (ADMs/path switches in Figures);

and the following steps executed in the second link termination node of the same pair:

- receiving the optical signal at the predetermined wavelength from either the first or the second carrier (ADMs/path switches in Figures).

Shiragaki et al. in view of Cadeddu et al. does not expressly disclose:

the following steps executed in the first link termination node of a pair:

- converting the optical signal into an electrical signal;

- adding to the electrical signal further information; and

- reconverting the electrical signal into an optical signal provided with a predetermined wavelength adapted for transmission;

and the following steps executed in the second link termination node of the same pair:

- converting the optical signal at the predetermined wavelength into an electrical signal;

- extracting from the electrical signal the further information;

- reconverting the electrical signal into an optical signal with a wavelength adapted for reception; and

- receiving the optical signal with the wavelength adapted for reception.

However, Karasan et al. teaches transponders that perform the first termination node steps of converting and reconverting and the second termination node steps of converting, reconverting, and receiving (Karasan et al., page 1343, col. 2, last paragraph). At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to incorporate the transponders of Karasan et al. in the method of Shiragaki et al. in view of Cadeddu et al. One of ordinary skill in the art would have been motivated to do this "to arrest accumulating performance-degradations; provide the open, nonproprietary interfaces that permit multivendor interworking; and offer a means of carrying out the performance-monitoring and fault-localization that are essential in deployed networks" (Karasan et al., page 1343, col. 2, last paragraph – page 1344, col. 1, 1st paragraph).

Shiragaki et al. in view of Cadeddu et al., further in view of Karasan et al., still does not expressly disclose:

the following steps executed in the first link termination node of a pair:

- adding to the electrical signal further information;

and the following steps executed in the second link termination node of the same pair:

- extracting from the electrical signal the further information.

However, adding and extracting further information from an electrical signal is extremely well known and conventional in the art. At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to include these steps in the method of

Shiragaki et al. in view of Cadeddu et al., further in view of Karasan et al. One of ordinary skill in the art would have been motivated to do this to provide a variety of standard features: clock recovery information (Karasan et al., page 1343, col. 2, last paragraph), destination address for the signal, and performance-monitoring and fault-localization means (Karasan et al., page 1344, col. 1, 1st paragraph).

14. **Claims 11-13** are rejected under 35 U.S.C. 103(a) as being unpatentable over de Boer et al. (U.S. Patent No. 6,259,837 B1) in view of Cadeddu et al. (as applied to claim 3 above under 35 U.S.C. 102(b)). **Claims 11-13** are also rejected under 35 U.S.C. 103(a) as being unpatentable over de Boer et al. in view of Shiragaki et al. in view of Cadeddu et al. (as applied to claim 3 above under 35 U.S.C. 103(a)).

Regarding claim 11, de Boer et al. discloses:

Optical transmission system (Figs. 4-7), including a first (bottom ring in Figs. 4-7) and a second ring (top ring in Figs. 4-7) network, wherein a first reconfigurable node (network element NE8 in Figs. 4-7) of the first ring network has a signal input (input to service selector 76 from path 54 in Figs. 4-7) which is optically coupled to a signal output (output from module 70 in Figs. 4-7) of a second reconfigurable node (network element NE6 in Figs. 4-7) of the second ring network.

De Boer et al. does not expressly disclose:

said ring networks being according to claim 3.

However, Cadeddu et al. and Shiragaki et al. in view of Cadeddu et al. both teach such ring networks (see treatment of claim 3 above under Cadeddu et al. and under Shiragaki et al. in view of Cadeddu et al.). At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to use the ring networks of Cadeddu et al. in the system of de Boer et al. It would also have been obvious to use the ring networks of Shiragaki et al. in view of Cadeddu et al. in the system of de Boer et al. In view of Cadeddu et al., one of ordinary skill in

the art would have been motivated to do this to provide a ring structure with good self-healing capabilities (Cadeddu et al., col. 1, lines 19-22). In view of Shiragaki et al. in view of Cadeddu et al., one of ordinary skill in the art would have been motivated to do this to provide short-length fault recovery routes and high efficient utilization of transmission mediums (Shiragaki et al., col. 2, lines 19-22).

Regarding claim 12, de Boer et al. in view of Cadeddu et al. and de Boer et al. in view of Shiragaki et al. in view of Cadeddu et al. both disclose:

Optical transmission system according to claim 11, wherein the second reconfigurable node (network element NE6 in Figs. 4-7) has a signal input (input to service selector 74 from path 54 in Figs. 4-7) which is optically coupled to a signal output (output from module 72 in Figs. 4-7) of the first reconfigurable node (network element NE8 in Figs. 4-7).

Regarding claim 13, de Boer et al. in view of Cadeddu et al. and de Boer et al. in view of Shiragaki et al. in view of Cadeddu et al. both disclose:

Optical transmission system according to claim 11, wherein a third reconfigurable node (network element NE10 in Figs. 4-7) of the first ring network has a signal input (input to network element NE10 from path 56 in Figs. 4-7) which is optically coupled to a signal output (output from network element NE3 to path 56 in Figs. 4-7) of a fourth reconfigurable node (network element NE3 in Figs. 4-7) of the second ring network, and the fourth reconfigurable node has a signal input (input to network element NE3 from path 56 in Figs. 4-7) which is optically coupled to a signal output (output from network element NE10 to path 56 in Figs. 4-7) of the third reconfigurable node.

15. **Claims 25-35** are rejected under 35 U.S.C. 103(a) as being unpatentable over Shiragaki et al. in view of Karasan et al.

Regarding claim 25, Shiragaki et al. discloses:

Reconfigurable node (nodes in Figures) for an autoprotected optical communication ring network (ring networks in Figures), comprising a receiving/transmitting module (receiving and transmitting components of nodes in Figures) including:

- a signal input (input to protection switches 211-212 in Fig. 2) for the insertion into the node of a signal including information to be transmitted in the network;

- a signal output (output from protection switches 213-214 in Fig. 2) for the extraction from the node of a signal including information transmitted in the network;

- a first transmitting means (source for input signal from NETWORK ELEMENT to protection switch 211 with switches 211 and 305 in Fig. 2) for optically coupling to a first carrier (ring 101 in Fig. 2) of the network and adapted to modulate a signal at a first wavelength ($\lambda 1$ in Fig. 2);

- a second transmitting means (source for input signal from NETWORK ELEMENT to protection switch 212 with switches 212 and 306 in Fig. 2) for optically coupling to the first carrier (ring 101 in Fig. 2) and adapted to modulate a signal at a second wavelength ($\lambda 2$ in Fig. 2);

- a third transmitting means (source for input signal from NETWORK ELEMENT to protection switch 211 with switches 211 and 305' in Fig. 2) for optically coupling to a second carrier (ring 102 in Fig. 2) of the network and adapted to modulate a signal at the first wavelength ($\lambda 1$ in Fig. 2);

- a first receiving means (NETWORK ELEMENT, splitters 301' and 217, and switch 214 in Fig. 2) for optically coupling to the second carrier (ring 102 in Fig. 2) and adapted to demodulate a signal having the first wavelength ($\lambda 1$ in Fig. 2);

- a second receiving means (NETWORK ELEMENT, splitters 302' and 219, and switch 213 in Fig. 2) for optically coupling to the second carrier (ring 102 in Fig. 2) and adapted to demodulate a signal having the second wavelength ($\lambda 2$ in Fig. 2);

- a third receiving transponder (NETWORK ELEMENT, splitters 302 and 220, and switch 213 in Fig. 2) for optically coupling to the first carrier (ring 101 in Fig. 2) and adapted to demodulate a signal having the second wavelength (λ2 in Fig. 2) ;

- reconfigurable optical connections (switches in Fig. 2) to selectively connect:

  • the signal input either to the first transmitting means or to the third transmitting means (note connections through protection switch 211 in Fig. 2);

  • the first receiving means to the third transmitting means (note connection from splitter 301' to path switch 305' in Fig. 2);

  • the second receiving means to the signal output (note output from switch 213 in Fig. 2); and

  • the third receiving means either to the signal output or to the second transmitting means (note connection from splitter 302 to switch 306 in Fig. 2).

Shiragaki et al. does not expressly disclose:

transmitting means and receiving means being transponders.

However, transponders are well known in the art, as shown by Karasan et al. (Karasan et al., page 1343, col. 2, last paragraph). At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to have the transmitting means and receiving means of Shiragaki et al. comprise transponders, as mentioned in Karasan et al. One of ordinary skill in the art would have been motivated to do this since they enable the adaptation of long-haul signals with long-haul wavelengths to standard cross-office interfaces that process signals with a standard cross-office wavelength (Karasan et al., page 1343, col. 2, last paragraph).

Regarding claim 26, Shiragaki et al. in view of Karasan et al. discloses:

Reconfigurable node according to claim 25, wherein the receiving/transmitting module further includes:

- a further signal input (inputs to protection switches 211-212 in Fig. 2) for the insertion into the node of a signal including information to be transmitted in the network;

- a further signal output (outputs from protection switches 213-214 in Fig. 2) for the extraction from the node of a signal including information transmitted in the network;

- a fourth transmitting transponder (source for input signal from NETWORK ELEMENT to protection switch 212 with switches 212 and 306' in Fig. 2 of Shiragaki et al. combined with transponder of Karasan et al.) optically coupled to the second carrier (ring 102 in Fig. 2) and adapted to modulate a signal at the second wavelength (λ2 in Fig. 2); and

- a fourth receiving transponder (NETWORK ELEMENT, splitters 301 and 218, and switch 214 in Fig. 2 of Shiragaki et al. combined with transponder of Karasan et al.) optically coupled to the first carrier (ring 101 in Fig. 2) and adapted to demodulate a signal having the first wavelength (λ1 in Fig. 2);

said reconfigurable optical connections selectively connecting:

• the first receiving transponder either to the third transmitting transponder or to the further signal output (note connections from splitter 301' to multiplexer 307 or to output from protection switch 214 in Fig. 2);

• the fourth receiving transponder to the further signal output (note connection from splitter 301 to output from protection switch 214 in Fig. 2); and

• the further signal input either to the second transmitting transponder or to the fourth transmitting transponder (note connections through protection switch 212 in Fig. 2).

Regarding claim 27, Shiragaki et al. in view of Karasan et al. discloses:

Reconfigurable node according to claim 25 or 26, characterized in that it is adapted to manage a predetermined set (λ1- λ2 in Fig. 2) of wavelengths within a set (col. 5, line 51 – col. 6, line 4) of transmission wavelengths and in that it includes a first and a second optical add/drop

multiplexer (ADM processors 209-210 in Fig. 2) optically coupling the receiving/transmitting module (receiving and transmitting components of nodes in Figures) to said first and, respectively, second carrier (rings 101-102 in Fig. 2) to feed/extract said subset of wavelengths to/from said first and, respectively, second carrier, and to pass-through the remaining wavelengths of the set of transmission wavelengths (col. 5, line 51 – col. 6, line 4).

Regarding claim 28, Shiragaki et al. in view of Karasan et al. discloses:

Reconfigurable node according to claim 25 or 26, further including at least a first optical power splitter (optical splitters 1501-1502 in Figs. 15A-C) for splitting signals coming from said at least a signal input (input to protection switches in Figs. 15A-C) and at least a second optical power splitter (splitters coupled to the input to protection switches in Figures) for splitting signals.

Shiragaki et al. in view of Karasan et al. does not expressly disclose:

said second optical power splitter for splitting signals coming from a respective one of said receiving transponders.

However, Karasan et al. teaches receiving transponders that adapt long-haul signals to standard cross-office interfaces (Karasan et al., page 1343, col. 2, last paragraph). At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to arrange said second optical power splitter for splitting signals coming from a respective one of said receiving transponders. One of ordinary skill in the art would have been motivated to do this in order to process the split signals in a standard wavelength (Karasan et al., page 1343, col. 2, last paragraph), thus simplifying components within the node.

Regarding claims 29 and 32-33, Shiragaki et al. in view of Karasan et al. does not expressly disclose:

the reconfigurable optical connections (22-25) including:

- 2x2 switches; or

- an integrated switching matrix; or
- optical switching components selectable in the group including:
  - opto-mechanical switches;
  - thermo-optical switches;
  - magneto-optical switches;
  - liquid crystal switches;
  - semiconductor switches;
  - electro-optical switches;
  - micro-mechanical switches; and
  - lithium niobate integrated circuit switches.

However, all these various switch configurations are well known and conventional in the art. At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to have the reconfigurable optical connections of Shiragaki et al. in view of Karasan et al. include one of these various switch configurations from this broad range of choices. One of ordinary skill in the art would have been motivated to do this to provide design flexibility, thus enabling one skilled in the art to make and use the node of Shiragaki et al. in view of Karasan et al. according to one's constraints in costs, space, and time.

Regarding claim 30, Shiragaki et al. in view of Karasan et al. discloses:

Reconfigurable node according to claim 25 or 26, wherein the reconfigurable optical connections include 1x2 and/or 2x1 switches (switches in Figures).

Regarding claim 31, Shiragaki et al. in view of Karasan et al. discloses:

Reconfigurable node according to claim 25 or 26, wherein the reconfigurable optical connections include discrete switching components (notice distinct switches in Figures).

Regarding claim 34, Shiragaki et al. in view of Karasan et al. discloses:

Reconfigurable node according to claim 25 or 26, characterized in that it includes a control processing unit (monitor circuits in Figures) operatively connected to said receiving transponders and said transmitting transponders.

Regarding claim 35, Shiragaki et al. in view of Karasan et al. does not expressly disclose:

Reconfigurable node according to claim 25 or 26, characterized in that it includes at least a further receiving/transmitting module which has substantially the same structure of said receiving/transmitting module and is adapted to operate with a different pair of wavelengths with respect to said receiving/transmitting module.

However, Shiragaki et al. notes the presence of other traffic signals that are not inserted or extracted at the pair of wavelengths of said receiving/transmitting module (col. 5, line 51 – col. 6, line 4). At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to include a further receiving/transmitting module, as disclosed in claim 35, in the node of Shiragaki et al. in view of Karasan et al. One of ordinary skill in the art would have been motivated to do this to utilize the wavelengths of the other traffic signals for increased communications, thus enabling the node to communicate with higher bandwidth and/or with more nodes.

Double Patenting

16. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970);and, *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

17. **Claims 1-6, 14-15, 18-23, 25-27, and 29-33** are provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-12 and 14-21 of copending Application No. 09/608,657. Although the conflicting claims are not identical, they are not patentably distinct from each other because the instant invention is an obvious variation of the invention defined in the claims of the copending application.

Regarding claim 1 of the instant application, consider claim 1 of the copending application. The "ring network" in claim 1 of the instant application corresponds to the "system" in claim 1 of the copending application. The notable difference between the conflicting claims is the presence of the following limitations in claim 1 of the instant application; that is, the following limitations are absent from claim 1 of the copending application:

a ring network; and

said respective working path having a complementary arc path defining a respective protection arc path in which the first wavelength on the first carrier and the second wavelength on the second carrier can be used for further links.

However, networks in the shape of rings are extremely well known and conventional in the art. At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to shape the "system" of the copending application into a ring form. One of ordinary skill in the art would have been motivated to do this since ring networks provide architectures with mature protection and bandwidth sharing options.

Additionally, a ring-shaped "system" of the copending application inherently introduces a complementary arc path (copending application, complementary path to "working link" in claim 1, line 7) defining a respective protection arc path in which the first wavelength on the first carrier and the second wavelength on the second carrier can be used for further links. At the

time the invention was made, it would have been obvious to a person of ordinary skill in the art to use this respective protection arc path of a ring-shaped "system" of the copending application. One of ordinary skill in the art would have been motivated to do this in order to provide high utilization of the available bandwidth in the respective protection arc path.

Summarily, claim 1 of the instant application includes limitations absent in claim 1 of the copending application; claim 1 of the instant application defines a narrower, yet obvious, version of the invention defined in claim 1 of the copending application.

Regarding claims 2-6, claims 2, 3, 4, 5, and 6 of the instant application are network claims that correspond closely to system claims 2, 3, 3, 4, and 5 of the copending application, respectively. The notable difference between claims 2-6 of the instant application and claims 2-5 of the copending application is the express disclosure of a signal input and a signal output (instant application, claim 3). However, the claims of the copending application discloses a switch unit coupled to an optical transmitter and to an optical receiver (copending application, claim 3); these couplings inherently comprise the signal input and signal output of the instant application. Therefore, claims 2-6 of the instant application define an obvious version of the invention defined in claims 2-5 of the copending application.

Regarding claim 14 of the instant application, consider claim 6 of the copending application. The notable difference between the conflicting claims is the presence of the following limitations in claim 14 of the instant application; that is, the following limitations are absent from claim 6 of the copending application:

each pair including a first and a second link termination node adapted to mutually communicate at respective first and second wavelengths; and

said respective working path having a complementary arc path defining a respective protection arc path in which the first wavelength on the first carrier and the second wavelength on the second carrier can be used for further links.

However, claim 6 of the copending application discloses, "exchanging optical signals between one of the pairs of nodes over one of the bi-directional links by using a first wavelength...and a second wavelength" (copending application, claim 6, lines 5-7). The "pair of nodes" of the copending application corresponds to the "pair including a first and a second link termination node" of the instant application. The "exchanging...by using a first wavelength...and a second wavelength" of the copending application corresponds to the "mutually communicate at respective first and second wavelengths" of the instant application.

Additionally, the ring network of the copending application inherently introduces a complementary arc path (copending application, complementary paths to "bidirectional links" in claim 6, lines 4 and 6) defining a respective protection arc path in which the first wavelength on the first carrier and the second wavelength on the second carrier can be used for further links. At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to use this respective protection arc path of a ring network of the copending application. One of ordinary skill in the art would have been motivated to do this in order to provide high utilization of the available bandwidth in the respective protection arc path.

Summarily, claim 14 of the instant application includes limitations absent in claim 6 of the copending application; claim 14 of the instant application defines a narrower, yet obvious, version of the invention defined in claim 6 of the copending application.

Regarding claims 15 and 18-22, claims 15, 18, 19, 20, 21, and 22 of the instant application are method claims that correspond closely to method claims 7, 8, 9, 10, 11, and 12 of the copending application, respectively. The differences between claims 15 and 18-22 of the instant application and claims 7-12 of the copending application are minor variations in the claim language; the main limitations are the same. Therefore, claims 15 and 18-22 of the instant application define an obvious version of the invention defined in claims 7-12 of the copending application.

Regarding claim 23, claim 23 is a method claim that corresponds to system claim 2. Therefore, the recited means in system 2 read on the corresponding steps in method claim 23.

Regarding claims 25-27 and 29-33, claims 25, 26, 27, 29, 30, 31, 32, and 33 of the instant application are node claims that correspond closely to node claims 14, 15, 16, 17, 18, 19, 20, and 21 of the copending application, respectively. The notable difference between claims 25-27 and 29-33 of the instant application and claims 14-21 of the copending application is the presence of extra limitations (copending application, claim 13) in the claims of the copending application; that is, these extra limitations are absent from the claims of the instant application. Thus, claims 25-27 and 29-33 of the instant application define a broader version of the invention defined in claims 14-21 of the copending application.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

18. **Claims 7-10 and 16-17** are provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 3 and 6 of copending Application No. 09/608,657 in view of Shiragaki et al.

Regarding claim 7, claim 3 of the copending application does not expressly disclose the following, but Shiragaki et al. does:

Ring network according to claim 3, wherein at least one of said reconfigurable nodes includes at least a first signal splitter (Shiragaki et al., splitters in ADMs/path switches in Figures) adapted to receive a signal from either the first or the second carrier and to split said signal into a first and a second fraction which are sent towards a respective signal output and towards the same carrier, respectively.

At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to implement the add-drop multiplexers (ADMs) that include the first signal splitter of Shiragaki et al. in the nodes of claim 3 of the copending application. One of ordinary

skill in the art would have been motivated to do this for a variety of advantages: these ADMs can be connected to ATM and SONET networks (Shiragaki et al., col. 5, lines 51-54) and also provide supervisory or OAM functions (Shiragaki et al., col. 6, lines 1-2).

Regarding claim 8, claim 3 of the copending application in view of Shiragaki et al. discloses:

Ring network according to claim 3, wherein at least one of said reconfigurable nodes (Shiragaki et al., node A in Fig. 15A-C) includes at least a second signal splitter (Shiragaki et al., optical splitters 1501-1502 in Figs. 15A-C) optically coupled to a respective signal input (Shiragaki et al., input to protection switches in Figs. 15A-C) and adapted to split a signal coming from the respective signal input into a first and a second fraction which are sent towards the first carrier (Shiragaki et al., rings 101 and 103 in Figs. 11A-15C) and the second carrier (Shiragaki et al., rings 102 and 104 in Figs. 11A-15C), respectively.

Regarding claim 9, claim 3 of the copending application in view of Shiragaki et al. discloses:

Ring network according to claim 3, wherein said optical switch unit (Shiragaki et al., protection switches and path switches in Figures) includes at least a first switch (Shiragaki et al., path switches in Figures) having a first input optically coupled to a respective signal input (Shiragaki et al., inputs to path switches from protection switches in Figures), a second input (Shiragaki et al., inputs to path switches from demultiplexers in Figures) coupled to either the first or the second carrier (Shiragaki et al., rings in Figures) and an output (Shiragaki et al., output from path switches) coupled to the same carrier.

Regarding claim 10, claim 3 of the copending application in view of Shiragaki et al. discloses:

Ring network according to claim 8, wherein said optical switch unit (Shiragaki et al., protection switches and path switches in Figures) includes at least a second switch (Shiragaki et

al., protection switches TO NETWORK ELEMENT in Figures) having a first input coupled (Shiragaki et al., via splitters) to the first carrier (Shiragaki et al., rings 101 and 103 in Figs. 11A-15C), a second input coupled (Shiragaki et al., via splitters) to the second carrier (Shiragaki et al., rings 102 and 104 in Figs. 11A-15C), and an output optically coupled to a respective signal output (Shiragaki et al., output TO NETWORK ELEMENT from protection switches).

Regarding claim 16, claim 6 of the copending application does not expressly disclose the following, but Shiragaki et al. does:

Method according to claim 14, including the steps of inserting a signal into one of said nodes (Shiragaki et al., node A in Fig. 15A-C), splitting (Shiragaki et al., optical splitters 1501-1502 in Figs. 15A-C) said signal into a first and a second fraction and sending said first fraction towards the first carrier (Shiragaki et al., rings 101 and 103 in Figs. 11A-15C) and the second power fraction towards the second carrier (Shiragaki et al., rings 102 and 104 in Figs. 11A-15C).

At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to implement the add-drop multiplexers (ADMs) of Shiragaki et al. that include the said steps of inserting and splitting in the nodes of claim 6 of the copending application. One of ordinary skill in the art would have been motivated to do this for a variety of advantages: these ADMs can be connected to ATM and SONET networks (Shiragaki et al., col. 5, lines 51-54) and also provide supervisory or OAM functions (Shiragaki et al., col. 6, lines 1-2).

Regarding claim 17, claim 17 is a method claim that corresponds to system claim 7. Therefore, the recited means in system claim 7 read on the corresponding steps in method claim 17.

This is a provisional obviousness-type double patenting rejection.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to David S. Kim whose telephone number is 703-305-6457. The examiner can normally be reached on Mon.-Fri. 9 AM to 5 PM (EST).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jason Chan can be reached on 703-305-4729. The fax phone numbers for the organization where this application or proceeding is assigned are 703-872-9314 for regular communications and 703-872-9314 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-305-4750.

DSK
May 13, 2003

JASON CHAN
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